# ANADROMOUS WATERS CATALOG/ATLAS CORRECTION FORM

CORRECTION TO: ATLAS X CATALOG
REGION: S.C. C
MAP: SEWARD C-7
WATERWAY NUMBER: 247-60-10170
DESCRIBE CHANGE(S): ALL UPPER LIMIT TO
SOCKEYE IN SIXMILE CREEK. Upper HMIT
WAS PREVIOUSLY LEFT OFF BY MISTAKE. Upper
Limit a Bench Creek Sixmile Creek
CONFLUENCE UNTIL FURTHUR INFORMATION AVAILABLE
PER ATMACHED USFS, REPORT & CONVERSATION W/
MARK WENGER (USFS) " FEW SOCKEYE IN CANYON CRECK
AND SIXMILE CREEK.
(a)
CHANGE REQUESTED BY: E. WEISS ENW3/6/92 Z/12/92 DATE
DRAFTED BY: F. I. 3/3/92 DATE
REVISION CODE:

<sup>\*\*</sup> ATTACH THIS FORM TO EXISTING NOMINATION FORM IN FILE \*\*

FINAL SEWARD (C-7) QUADRANGLE ALASKA KENAI PENINSULA BOROUGH 163 % SERIES (TOPOGRAPHIC) - 144 Is 207 620 000 FEET 60 45 2 460 000 3008

## ATES DEPARTMENT OF AGRICULTE FOREST SERVICE

# Seward Office Box 275

REPLY TO:

2630 Habitat

October 17, 1979

SUBJECT:

Preliminary Survey Report on Sixmile Creek System, Kenai Peninsula



TO: Jim Doyle

Fishery Project Leader

## INTRODUCTION:

The Sixmile Creek system, which contains 232 stream miles and 407 lake acres, has been identified as a salmon habitat enhancement project in the Chugach National Forest's Multi-Year Initiative Proposal for Anadromous Fish Enhancement of February, 1979. In the first planning level of the proposal, each system will be intensively surveyed and assessed for biological capability and suitability for two years before construction.

In accordance with this directive, a fifteen day intensive survey utilizing helicopter transport was conducted on the Sixmile system during August 13-30, 1979. Survey methods used were the Level III and IV surveys discribed in The Alaskan Stream Inventory System of May, 1979.

All fishery personnel on the Chugach National Forest as well as representatives from other interested State and Federal agencies and private organizations were involved in the survey program. A total of 153 man-days were spent on the Sixmile system. Survey team members are listed below.

#### Forest Service Personnel:

#### Permanent Employees

- 1. Rob Bentz
- Ralph Browning
- 3. Ron Burraychak
- Bill Craine
- 5. Jim Doyle
- Ken Holbrook

#### B. Seasonal Employees

John Gallis

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# C. CETA Employees

- Ray Baker
- 2. Bruce Burton
- 3. Bill Lorenz

## D. Fishery Volunteers

- 1. Mike Caffey
- 2. Diane Lapp
- 3. Rand Little
- 4. Dave Petree
- 5. Jay Ver Hoef

# E. YACC Enrollees

Ann Muerlott

# II. Cooperating Agnecy Personnel:

- 1. Jim Friedersdorff, U.S. Fish and Wildlife Service
- Gary Kyle, Alaska Dept. of Fish and Game F.R.E.D. Division
- 3. Tom Mears, Cook Inlet Aquaculture Association

#### SURVEY RESULTS:

A total of 1241 Level III surveys and 56 Level IV surveys, which is equivalent to over 39 stream miles, were completed on the Sixmile system. The number of surveys completed for each stream within the system is given below.

	No. of Surveys Completed					
STREAM	LEVEL III	LEVEL IV				
Sixmile Creek	199	10				
East Fork Creek	254	10				
Canyon Creek	128	6				
Bench Creek	238	10				
Center Creek	108	10				
Granite Creek	314	10				
TOTAL	1241	56				

Detailed analysis of all survey data has not been completed. However, preliminary results show that the three identified velocity barrier areas do not act as complete barriers to salmon migration as had been thought earlier.

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Extensive minnow trapping and adult counts indicate that some king and coho salmon are passing through these barrier areas. King and coho fingerlings were found dispersed throughout most of the system (Table 1). Resident Dolly Varden char were the most numerous fishes trapped. Approximately 1400 pink salmon and one chum salmon were observed in the intertidal influence area of Sixmile Creek within one mile of Tunagain Arm. Also, three adult sockeye salmon were spotted above the velocity areas in a small clearwater tributary of Bench Creek.

Two engineering feasibility studies were conducted on the Sixmile system during the summer of 1979. One study was done by Bill Craine, Fishery Engineer for the U.S.D.A. Forest Service. Jack Fisher, under contract with Cook Inlet Aquaculture Association, completed the second study. Similar conclusions were reached in both studies.

Three areas were identified as possible velocity barriers. Two areas are located on Sixmile Creek and one area on East Fork Creek near the confluence with Gulch Creek.

The two areas on Sixmile Creek had average water velocities greater than 10 h.p.s. However, within these areas there were small pockets with lower velocities which would allow passage of king and silver salmon during most flow stages.

Both studies stated that construction projects to improve fish passage on Sixmile were not feasible. The creek in these areas flows through a steep, narrow canyon with no disposal areas for excavated materials. Also, the numerous roads which would be needed to get men and equipment in and out of the work sites would result in unacceptable environmental disturbance to this scenic area.

The gorge area on East Fork Creek near Gulch Creek was identified as the worst section on the entire system. It may be a barrier at a wider range of flows than the lower sections. This barrier is passable by construction of a tunnel fishway with a barrier to crowd the fish into the tunnel. A rough cost estimate would be near 5 or 6 million dollars. This would be a costly project with questionable benefits. The fact that some fish are making it past this area makes the need for a fishway questionable.

In conclusion, both engineers felt that, due to the fact that some fish were presently making it through the three velocity areas, there was not a barrier of sufficient magnitude to warrent the construction of a fishway.

#### CONCLUSIONS:

The three velocity barrier areas on the Sixmile System are not a complete barrier to salmon migration. King and coho salmon have been observed throughout the majority of the system. However, the low numbers of fish compared to the large amount of habitat available seems to indicate that

TABLE 1. - Results of minnow Trapping and Adult Counts on Sixmile Creek System in August, 1979

TOTAL	Granite Creek	Center Creek	Bench Creek	Canyon Creek	East Fork Creek	Sixmile Creek	STREAM
	i.	,				<b>.</b>	
222 6	1 4	P.	ъ	WAS NOT	42 1	177	FINGERLINGS KS* SS
60 1,042	43. 392	2 82	0 145	NOT TRAPPED	10 369	5 54	INGS
			α				
70	17	ω	0	9	2	39	ADULTS

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<sup>\*</sup> KS: DV: Dolly Varden King Salmon Silver Salmon

some limiting factor or combination of factors is operating within the system. A list of potential limiting factors based on other comparable systems and the professional opinions of the survey biologists is given below.

# 1. Rearing Area:

Sufficient amount and quality of rearing area seems to be lacking in all major streams except Granite Creek. The most common type of available rearing area found is in nearly dry, braided channels of the main stream course. These channels, which contain fast flowing water during high flow stages, are generally very exposed. The only available cover is usually bottom substrate and debris.

Also, some areas containing excellent rearing area; i.e. constant flow and abundant cover, are presently not available to salmon fry due to impassable beaver dams, bridge culverts or other obstacles.

## 2. Historical Fishery:

A fish trap or fish wheels may have been operated at the mouth of Sixmile Creek during the mining boom days when Sunrise had a population of nearly 2,000 persons. It is well documented that a trap which completely crosses the stream mouth and catches every fish going upstream can destroy a salmon run in a few years. This may have occurred, and the remnants of the fish population have been unable to build themselves back up.

# 3. Heavy Metal Toxicity:

During a conversation with a miner on Sixmile Creek the fact was mentioned that it is not uncommon to find small drops of mercury when gold panning in gravel along and in the stream. If mercury concentrations are in the water or spawning gravels, the result could be heavy mortality of salmon eggs and/or fry which are the most susceptable stages.

#### 4. System Stability:

The Sixmile System is still relatively young, geologically speaking. Several areas were identified where active streambed cutting and movement were occurring. If severe enough, this situation could cause heavy mortality of the eggs and fry before emergence from the redds.

## 5. Mining Activity:

Past and present mining activity on the Sixmile System, expecially Canyon, Center and Bench Creek, has been intense. Current mining operations include suction dredging, placer and hydrolic mining. There are 94 active claims within the system. Although todays miners are regulated as to the time and extent of their operations, earlier miners had few if any restrictions. The substrate disturbances, siltation, damming and diversions that occurred may have had a significant effect on the fish populations of the system.

Although the major construction project as stated in the Multi-Year Initiative Proposal has been determined unfeasible at this time, there are alternative enhancement possibilities for the Sixmile system. Complete analysis of the survey data will identify some enhancement opportunities. Also, areas which need further study will be indicated. Study plans will be devised to pinpoint the limiting factor(s) operating and the means by which to correct them.

Two types of projects I feel would help increase salmon populations are:

- 1. Open up areas containing very good rearing which are presently un-available and create additional rearing area.
- Enter into a cooperative agreement with Alaska Department of Fish and Game to stock salmon eggs and/or fry throughout the system.

ROBERT W. BENTZ

Fishery Biologist